



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of : **Confirmation No. 9023**
Shinya TANAKA et al. : Attorney Docket No. 2006_0832A
Serial No. 10/584,307 : Group Art Unit 1796
Filed June 23, 2006 : Examiner Megan C. Arnberg
EPOXY COMPOUNDS AND CURED
EPOXY RESINS OBTAINED
BY CURING THE COMPOUNDS : **Mail Stop: Amendment**

SUBMISSION OF PCT IPRP

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

THE COMMISSIONER IS AUTHORIZED
TO CHARGE ANY DEFICIENCY IN THE
FEE FOR THIS PAPER TO DEPOSIT
ACCOUNT NO. 23-0975.

Sir:

Applicants are submitting herewith a copy of the PCT International Preliminary Report on Patentability issued in connection with the PCT application on which the present U.S. application is based, including a translation of the PCT Written Opinion.

Respectfully submitted,

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June 5, 2008

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44bis)

Applicant's or agent's file reference 664885	FOR FURTHER ACTION	See item 4 below
International application No. PCT/JP2004/019186	International filing date (<i>day/month/year</i>) 22 December 2004 (22.12.2004)	Priority date (<i>day/month/year</i>) 24 December 2003 (24.12.2003)
International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237		
Applicant SUMITOMO CHEMICAL COMPANY, LIMITED		

1. This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 bis.1(a).

2. This REPORT consists of a total of 7 sheets, including this cover sheet.

In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.

3. This report contains indications relating to the following items:

- | | | |
|-------------------------------------|--------------|---|
| <input checked="" type="checkbox"/> | Box No. I | Basis of the report |
| <input type="checkbox"/> | Box No. II | Priority |
| <input type="checkbox"/> | Box No. III | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability |
| <input type="checkbox"/> | Box No. IV | Lack of unity of invention |
| <input checked="" type="checkbox"/> | Box No. V | Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement |
| <input checked="" type="checkbox"/> | Box No. VI | Certain documents cited |
| <input type="checkbox"/> | Box No. VII | Certain defects in the international application |
| <input checked="" type="checkbox"/> | Box No. VIII | Certain observations on the international application |

4. The International Bureau will communicate this report to designated Offices in accordance with Rules 44bis.3(c) and 93bis.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44bis .2).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No. +41 22 338 82 70	Date of issuance of this report 22 August 2006 (22.08.2006) Authorized officer <div style="text-align: center; font-weight: bold; font-size: 1.2em;">Masashi Honda</div> e-mail: pt08@wipo.int
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PATENT COOPERATION TREATY

TRANSLATION

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

Date of mailing
(day/month/year)

Applicant's or agent's file reference

664885

FOR FURTHER ACTION

See paragraph 2 below

International application No.

PCT/JP2004/019186

International filing date (day/month/year)

22.12.2004

Priority date (day/month/year)

24.12.2003

International Patent Classification (IPC) or both national classification and IPC

Applicant

SUMITOMO CHEMICAL COMPANY, LIMITED

1. This opinion contains indications relating to the following items:

- | | | |
|-------------------------------------|--------------|--|
| <input checked="" type="checkbox"/> | Box No. I | Basis of the opinion |
| <input type="checkbox"/> | Box No. II | Priority |
| <input type="checkbox"/> | Box No. III | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability |
| <input type="checkbox"/> | Box No. IV | Lack of unity of invention |
| <input checked="" type="checkbox"/> | Box No. V | Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement |
| <input checked="" type="checkbox"/> | Box No. VI | Certain documents cited |
| <input type="checkbox"/> | Box No. VII | Certain defects in the international application |
| <input checked="" type="checkbox"/> | Box No. VIII | Certain observations on the international application |

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/JP

Authorized officer

Facsimile No.

Telephone No.

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/JP2004/019186

Box No. I

Basis of this opinion

1. With regard to the language, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
☐ This opinion has been established on the basis of a translation from the original language into the following language _____, which is the language of a translation furnished for the purposes of international search (under Rule 12.3 and 23.1(b)).
2. With regard to any nucleotide and/or amino acid sequence disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material
☐ a sequence listing
☐ table(s) related to the sequence listing
 - b. format of material
☐ in written format
☐ in computer readable form
 - c. time of filing/furnishing
☐ contained in the international application as filed.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table(s) relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

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Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	4, 6, 8	YES
	Claims	1-3, 5, 7	NO
Inventive step (IS)	Claims		YES
	Claims	1-8	NO
Industrial applicability (IA)	Claims	1-8	YES
	Claims		NO

2. Citations and explanations:

This opinion is based on the following documents cited in the ISR.
 Document 1: JP 7-508797 A (Europäische Wirtschaftsgemeinschaft)
 Document 2: JP 8-277247 A (Merck Patent GmbH.)
 Document 3: JP 9-118673 A (Cornell Research Foundation, Inc.)
 Document 4: JP 7-258638 A (Merck Patent GmbH.)
 Document 5: WATSON, M.J., et al., J. Mater. Chem., 1998, 8(9), pp. 1963-1969
 Document 6: JP 7-156020 A (Mitsubishi Electric Corp.)
 Document 7: JP 7-316526 A (Gould Electronics Inc.)

Claims 1-3, 5, 7

Document 1 describes various substitution groups for anisotropic polymers of liquid crystal diepoxides as formula (1), lists substitution groups that can be selected for the compound of the invention of the present application, and describes hardening by polymerization. This being the case, the inventions of claims 1-3, 5, and 7 are described in document 1.

Therefore the inventions of claims 1-3, 5, and 7 do not appear to possess novelty or to involve an inventive step over document 1.

Claims 1-8

The inventions of claims 1-8 differ from document 1 with regard to manufacturing method, specific substitution groups and hardening agents, and prepreg.

Nevertheless, the existence of various substitution groups as compounds that can manufacture a liquid crystalline epoxy resin having a diepoxide structure are described in the claims and embodiments of documents 2 through 4 and in the Experimental item in document 5. Utilizing the various substitution groups described in these instead of what is described in document 1 and achieving the compound of the invention of the present application would not require special creativity on the part of a person skilled in the art. Also, regarding the point about manufacturing method, a step of adding an alkenyl group constituting an epoxy group and oxidizing the alkenyl group and creating an epoxy group is described in documents 2 through 4. Therefore reversing the order of these processes and achieving the manufacturing method of the invention of the present application would not be especially difficult for a person skilled in the art. In addition, regarding the point about specific hardening agents and prepreg, in an epoxy resin having a chemical structure similar

(Continued in the Supplemental Box)

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Box No. VI

Certain documents cited

1. Certain published documents (Rule 43bis.1 and 70.10)

Application No. Patent No.	Publication date (day/month/year)	Filing date (day/month/year)	Priority date (valid claim) (day/month/year)
JP 2005-29788 A [PX]	03.02.2005	18.06.2004	19.06.2003

2. Non-written disclosures (Rule 43bis.1 and 70.9)

Kind of non-written disclosure	Date of non-written disclosure (day/month/year)	Date of written disclosure referring to non-written disclosure (day/month/year)
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WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.

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Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

Claims 1-8

In the compound represented by general formula (1) described in claim 1, substitution groups Q1 and Q2 are alkylene groups with 1-9 carbon atoms, and oxygen atoms or substitute amino groups may be inserted between the methylene groups that constitute the alkylene group.

Nevertheless, according to this description there is a very large number of things equivalent to substitution groups Q1 and Q2, and the compound group represented by general formula (1) does not have a chemical structure common enough that it can be summarized and understood as a single inventive concept by a person skilled in the art. It is unclear. Also, upon examining the description in the specification too, what is specifically manufactured is only the case when both substitution groups Q1 and Q2 are a methylene group. This being the case, one cannot say that the inventions of these claims are clearly and sufficiently disclosed by the description in the specification and claims to the extent that a person skilled in the art could practice them. Also, the inventions of these claims are unclear, and are not sufficiently supported by the specification (PCT Rule 5 and Rule 6).

Since the present application does not sufficiently disclose these inventions, only the rational scope in terms of the description in the specification was considered in preparing this opinion.

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

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Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of: Box V

to the compounds described in documents 1 through 5, 4,4'-diaminodiphenylmethane, etc. is described as a hardening agent, and prepreg obtained by semihardening an epoxy composition is described as a resin application in documents 6 and 7. Therefore hardening the compound of the invention of the present application with the hardening agent described in documents 6 and 7 and making an epoxy resin, or semihardening it and making prepreg would not be especially difficult for a person skilled in the art.

Therefore the inventions of claims 1-8 do not appear to involve an inventive step based on documents 1 through 7.